

Cometary Observations at the Liverpool Observatory, 1897-8. By W. E. Plummer, M.A.

The following observations form a continuation of the series of measures published in May 1896. The remarks made in that place concerning the instrument employed and the nature of the micrometers apply equally well to these observations. The general faintness of the Comets that have been recently discovered has operated unfavourably in many cases, and, notwithstanding the number of these objects recently discovered, the number of observations is less than in former years.

Comet VII. 1896 (Perrine, December 8).

Greenwich Mean Time of Observation.	*R.A. h m s	No. of Compari- sons.	Apparent R.A. of γ . h m s	Declination. ° ' "	No. of Compari- sons.	Apparent Declination of β .			Log. Factor of Parallax in (a).	Log. Factor of Parallax in (b).	Star of Com- parison.
						°	'	"			
1896. Dec. 11	7 10 30.1	25	-2 21.99	+ 2 30.9	5	+ 5	23	10.2	-8.8616	-0.8143	1
22	7 0 55.0	30	+0 53.61	+ 5 8.2	6	+ 1	35	11.6	-9.1169	-0.8386	2
27	6 17 40.6	25	-2 18.55	- 5 52.5	5	+ 0	28	3.8	-9.3045	-0.8450	3
27	6 17 40.6	25	-2 3.88	- 0 56.7	5	+ 0	28	2.6	-9.3045	-0.8450	4
28	8 0 23.2	Ret.	-1 24.28	-10 49.8	Ret.	+ 0	16	29.2	-8.7774	-0.8457	5
30	8 40 7.3	"	+1 9.87	+10 15.3	"	- 0	2	19.7	-7.7051	-0.8474	6
1897. Jan. 5	7 42 37.9	25	-1 41.53	- 0 47.4	5	- 0	37	56.5	-8.9920	-0.8506	7
8	8 2 0.4	30	-3 6.97	- 4 17.4	6	- 0	46	8.3	-8.8522	-0.8514	8
20	7 3 51.2	Ret.	-0 58.25	+ 3 11.8	Ret.	- 0	32	20.7	-9.1785	-0.8499	9
26	9 32 45.0	"	-1 30.65	+ 5 3.4	"	- 0	6	38.5	+8.8988	-0.8478	10
26	9 32 45.0	"	+0 35.01	- 5 9.1	"	- 0	6	41.2	+8.8988	-0.8478	11

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Periodic Comet of D'Arrest.

Greenwich Mean Time of Observation.	♂-★ R.A. m s	No. of Comari- sons.	Apparent R.A. of ♂. h m s	♂-★ Declination. ° ' "	No. of Comari- sons.	Apparent Declination of ♂. ° ' "	Log. Factor of Parallax in (a).	Star of Com- parison.
1896. July 9	14 42 60	Ret.	2 31 19.92	+9 56.1	Ret.	+ 6 33 50.8	-9.5261	12
Comet III. 1897 (Perrine, October 16).								
Oct. 20	8 40 46.3	25	3 9 22.60	-5 31.5	5	+72 19 32.0	-0.0371	13
22	9 27 32.6	30	2 45 11.64	+1 25.7	6	+75 15 36.8	-0.0294	14
22	9 27 32.6	30	2 45 11.21	+1 23.4	6	+75 15 40.2	-0.0294	15
24	7 55 36.0	25	2 11 38.29	+0 30.1	5	+77 47 35.8	-0.1720	16
26	8 23 1.9	Ret.	1 20 17.82	+0 31.0	Ret.	+79 58 2.3	-0.1286	17
29	8 58 27.0	"	23 26 37.0	-1 31.8	"	+81 39 47.3	-8.8494	18
29	8 58 27.0	"	23 26 35.3	-2 9.9	"	+81 39 45.1	-8.8494	19
30	10 13 27.3	"	22 41 29.6	+7 31.9	"	+81 39 36.2	+0.0390	20
30	10 13 27.3	"	22 41 31.3	-3 47.8	"	+81 39 33.9	+0.0390	21
Nov. 1	10 6 1.3	"	21 26 25.2	+3 12.7	"	+80 51 42.6	+0.2174	22
Comet I. 1898 (Perrine, March 19).								
1898. Mar. 21	16 4 11.0	25	21 24 35.02	-1 52.4	5	+18 25 24.1	-9.5648	23
21	16 4 11.0	25	21 24 35.20	+4 5.6	5	+18 25 27.2	-9.5648	24
22	16 9 20.5	25	21 28 18.26	-0 59.7	5	+19 27 52.5	-9.5663	25
23	16 20 30.2	12	21 32 5.82	+2 10.1	3	+20 30 28.7	-9.4656	26

Greenwich Mean Time of Observation.		★ R.A.		No. of Compari- sons.	Apparent R.A. of ☿.		★ Declination.		No. of Compari- sons.	Apparent Declination of ☿.		Log. Factor in (α').	Star of Con- parison.
h m s		m s	s		h m s	s	' "	"		° ' "	"		
1896. Mar.	27	15 56	23.9	25	21 47	35.14	+ 4	5.5	5	+ 24	36	- 9.5846	27
	27	15 56	23.9	25	21 47	35.07	+ 1	47.1	5	+ 24	36	- 9.5846	28
	28	15 32	6.4	Ret.	21 51	31.83	+ 4	34.8	Ret.	+ 25	35	- 9.5896	29
	31	15 11	54.1	30	22 3	50.38	+ 6	25.1	6	+ 28	34	- 9.5984	30
	31	15 11	34.1	30	22 3	50.45	+ 6	38.3	6	+ 28	34	- 9.5984	31
Apr.	1	15 27	38.0	Ret.	22 8	3.41	+ 4	25.4	Ret.	+ 29	32	- 9.6048	32
	3	15 40	5.4	25	22 16	46.36	- 1	4.1	5	+ 31	29	- 9.6140	33
	6	14 53	31.3	30	22 29	59.42	+ 8	22.2	6	+ 34	13	- 9.6181	34
	8	14 59	5.0	25	22 39	11.18	- 7	36.9	5	+ 36	0	- 9.6292	36
	8	14 59	5.0	25	22 39	11.16	+ 1	2.3	5	+ 36	0	- 9.6292	36
May	12	15 30	16.2	Ret.	22 58	18.90	+ 1	8.6	Ret.	+ 39	21	- 9.6557	37
	14	13 32	45.4	25	23 7	43.51	+ 5	17.7	5	+ 40	51	- 9.6428	38
	14	13 32	45.4	25	23 7	43.32	- 4	7.5	5	+ 40	51	- 9.6428	39
	25	12 50	11.3	Ret.	0 4	41.12	- 5	18.6	Ret.	+ 47	58	- 9.5475	40
	30	13 50	29.0	"	- 3	11.33	- 1	16.7	"	+ 50	24	- 9.6567	41
June	2	13 49	16.6	"	- 4	1.49	- 2	31.6	"	+ 51	13	- 9.6588	42
	17	12 58	32.2	Ret.	3 44	54.86	+ 2	45.9	Ret.	+ 58	2	- 9.6434	43
Comet V. 1898 (Perrine, June 14).													

Comet VII. 1898 (Perrine-Chofardet, September 14).

Greenwich Mean Time of Observation.	♄ — ★ R.A.			No. of Compari- sons.			Apparent R.A. of ♄.			♄ — ★ Declination.		No. of Compari- sons.	Apparent Declination of ♄.		Log. Factor of Parallax in (α).	in (δ).	Star of Com- parison.			
	h	m	s	h	m	s	h	m	s	'	"		°	'				"		
1866, Sept. 16	15	30	40.0	-1	58	92	25	9	57	55.60	+0	43	6	5	+29	8	30.2	-9.5908	-0.8296	44
21	16	25	11.3	+2	0	61	20	10	29	41.77	+9	1	0	4	+25	47	48.5	-9.5898	-0.8101	45
25	16	16	25.4	+0	43	10	Ret.	10	55	19.60	+0	49	4	Ret.	+22	34	59.4	-9.5754	-0.8305	46

Notes.

Comet VII. 1896 December 11.—Comet easily seen, notwithstanding moonlight. Bright wire illumination defective. December 22.—Slight fog and haze; observations unsatisfactory. December 28.—The instrument was not reversed; parallel doubtful. January 20.—Comet brighter than expected, but the individual measures are discordant. January 26.—Sky not very transparent; Comet too faint an object for accurate observation in this instrument.

Periodic Comet of D'Arrest.—The approaching daylight rendered this observation very difficult. The observation is not considered trustworthy.

Comet III. 1897 October 20.—Owing to the position of the Comet, the telescope could not be conveniently reversed. Error of adjustment of the parallel will probably affect the observations. October 24.—The Comet better seen than on the previous night. October 29.—No suspicion of nucleus; the observation refers to the centre of the nebula. November 1.—The Comet very feeble; some of the measures have been rejected as evidently erroneous.

Comet I. 1898 March 21.—Comet fairly bright; distinct nucleus of about 8th mag., and suspicion of tail. March 23.—Haze and fog; Comet seen with difficulty, and observation of little value. March 31. Coma estimated at 3' diameter and tail about 20' in length. April 1.—The observation was unsatisfactory; Comet seemed so ill-defined. April 6.—Notwithstanding the strong moonlight the Comet was easily seen, and the observation thought good. April 14.—Apparently no condensation; the centre of the nebula observed. April 25.—Images very bad; clouds rising rendered later observation impossible. May 2.—Comet appears as a faint nebula 2' in diameter; centre observed.

Comet VII. 1896, Perrine.

Date.	Star's Designation or Authority for Places.	Mean R.A. Equinox of Year.	Correction to Mean R.A.	Mean Declination. Equinox of Year.	Correction to Mean Declination.	Letter of Reference.
1896. Dec. 11	A.G.Z. Albany, No. 353	h m s 1 12 11.01	+ 4.20	+ 5 20 12.1	+ 27.2	1
22	Glasgow, 1860, No. 551; Glasgow, 1890, No. 195	2 22 37.77	+ 4.49	+ 1 29 39.9	+ 23.5	2
27	Glasgow, 1860, No. 695; Glasgow, 1890, No. 245	2 54 56.22	+ 4.60	+ 0 33 35.0	+ 21.3	3
27	Harvard College, Zones Nos. 34. 35; No. 15	2 54 41.62	+ 4.60	+ 0 28 38.0	+ 21.3	4
28	Schjellerup, No. 869	2 59 53.87	+ 4.62	+ 0 26 58.1	+ 20.9	5
30	Göttingen, Nos. 863-4	3 8 1.80	+ 4.63	- 0 12 55.0	+ 20.0	6
1897. Jan. 5	Göttingen, No. 961; Paris, No. 4428	3 39 40.47	+ 1.68	- 0 37 14.8	+ 5.7	7
8	Schjellerup, No. 1240	3 54 9.97	+ 1.72	- 0 41 56.3	+ 5.4	8
20	Göttingen, No. 1282-3	4 36 5.32	+ 1.85	- 0 35 35.6	+ 3.1	9
26	Göttingen, No. 1414	4 55 25.65	+ 1.86	- 0 11 45.1	+ 3.2	10
26		4 53 19.86	+ 1.86	- 0 1 35.4	+ 3.3	11

Periodic Comet of D'Arrest.

July 9	Piazzi II., No. 123; Paris, No. 3205	2 30 25.80	+ 2.04	+ 6 23 38.4	+ 16.3	12
Comet III., 1897.						
Oct. 20	Arg. Oeltz., No. 3539	3 7 28.04	+ 9.87	+ 72 24 48.2	+ 15.3	13
22	Arg. Oeltz., No. 3196; B. B. vi. No. 113	2 44 58.67	+ 10.89	+ 75 13 52.7	+ 18.4	14
22	Arg. Oeltz., No. 3199; B. B. vi. No. 114	2 45 15.52	+ 10.87	+ 75 13 58.5	+ 18.3	15
24	Groombridge, No. 469; Arg. Oeltz., No. 2520, I	2 10 27.50	+ 11.65	+ 77 46 42.9	+ 22.8	16

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Date.	Star's Designation or Authority for Places.	Mean R.A. Equinox of Year.	Correction to Mean R.A. s	Mean Declination. Equinox of Year.	Correction to Mean Declination. "	Letter of Reference.
1896.		h m s		° ' "		
Oct. 26	Quoted from <i>Monthly Notices</i> , 1897 November	1 18 1·85	+ 11·30	+79 57 2·6	+28·7	17
29	Carrington, No. 3613	23 26 57·3	+ 5·85	+81 40 42·9	+36·2	18
29	Carrington, No. 3616	23 27 9·8	+ 5·80	+81 41 19·0	+36·0	19
30	Carrington, No. 3472	22 37 12·92	+ 2·10	+81 31 27·8	+36·5	20
30	Carrington, No. 3495	22 45 48·87	+ 2·68	+81 42 45·1	+36·6	21
Nov. 1	Northfield Mer. Obsns., <i>Ast. Journal</i> , No. 421	21 17 38·10	— 4·08	+80 47 56·1	+33·8	22
<i>Comet I., 1898.</i>						
1898.						
March 21	A.G.Z. Berlin A., No. 8751	21 22 32·58	+ 0·42	+18 27 22·6	— 6·6	23
21	A.G.Z. Berlin A., No. 8763	21 24 21·38	+ 0·41	+18 21 27·5	— 5·9	24
22	A.G.Z. Berlin A., No. 8802	21 30 2·88	+ 0·41	+19 28 58·1	— 5·9	25
23	A.G.Z. Berlin B., No. 8285	21 29 27·79	+ 0·40	+20 28 24·6	— 6·0	26
27	A.G.Z. Berlin B., No. 8427	21 45 56·36	+ 0·36	+24 32 13·8	— 5·4	27
27	A.G.Z. Berlin B., No. 8438	21 47 58·82	+ 0·35	+24 34 32·9	— 5·6	28
28	A.G.Z. Cambridge, No. 13058	21 53 52·31	+ 0·33	+25 31 29·4	— 5·4	29
31	A.G.Z. Cambridge, No. 13175	22 0 57·27	+ 0·31	+28 28 5·5	— 5·4	30
31	A.G.Z. Cambridge, No. 13204	22 2 50·29	+ 0·31	+28 27 52·7	— 5·3	31
April 1	A.G.Z. Cambridge, No. 13245	22 6 3·48	+ 0·30	+29 28 30·1	— 5·3	32
3	A.G.Z. Leiden, Nos. 7-8	22 13 59·09	+ 0·27	+31 30 13·5	— 5·1	33
6	A.G.Z. Leiden, Nos. 106-109	22 31 24·52	+ 0·23	+34 5 25·9	— 4·4	34

Date	Star's Designation or Authority for Places.	Mean R.A. Equinox of Year. h m s	Correction to Mean R.A. s	Mean Declination. Equinox of Year. ° ′ ″	Correction to Mean Declination. ″	Letter of Reference.
1896. April 8	A.G.Z. Lund, Nos. 66, 523	22 34 16.72	+ 0.21	+ 36 8 3.1	- 4.5	35
8	A.G.Z. Lund, Nos. 289, 329, 556	22 44 57.96	+ 0.20	+ 35 59 22.5	- 4.0	36
12	A.G.Z. Lund, Nos. 44, 47, 528	22 58 1.18	+ 0.16	+ 39 20 37.4	- 3.5	37
14	A.G.Z. Berne, No. 17515	23 5 43.58	+ 0.14	+ 40 46 16.4	- 3.2	38
14	A.G.Z. Berne, No. 17554	23 8 24.27	+ 0.13	+ 40 55 41.8	- 3.0	39
25	A.G.Z. Berne, No. 71	0 5 24.90	+ 0.08	+ 48 3 41.0	- 0.7	40
30	A.G.Z. Cambridge, No. 285	0 35 13.72	+ 0.11	+ 50 25 36.0	+ 0.5	41
May 2	A.G.Z. Cambridge, No. 379	0 46 58.84	+ 0.16	+ 51 16 14.9	+ 0.8	42
June 17	A.G.Z. Helsingfors, No. 3174	3 37 37.68	+ 1.43	+ 57 59 38.2	+ 1.6	43
Sept. 16	A.G.Z. Cambridge, No. 5205	9 59 52.14	+ 2.38	+ 29 7 59.9	- 13.3	44
21	A.G.Z. Cambridge, No. 5398	10 27 38.86	+ 2.30	+ 25 39 1.6	- 14.1	45
25	A.G.Z. Berlin B., No. 4152	10 54 34.27	+ 2.23	+ 22 34 24.6	- 14.6	46

Liverpool Observatory:
1898 December 8.